TWO CRYPTIC NEW FIREFLY SPECIES IN THE GENUS PHOTINUS (COLEOPTERA: LAMPYRIDAE)

By James E. Lloyd[1, 2, 3]

Studies on the mating behavior of *Photinus* fireflies have resolved each of three familiar species into a cryptic species-pair. For each pair one sibling requires formal characterization and a name. Two of the necessary descriptions are furnished here; description of the third species is deferred until critical observations can be made.

Photinus macdermotti Lloyd, NEW SPECIES

DIAGNOSIS: This species has previously been confused with *Photinus consanguineus* LeConte. Male flash pattern with two flashes approximately two seconds apart (versus two flashes one-half second apart in *consanguineus*). Procoxae with anterior surfaces fuscous or piceous (versus pale in *consanguineus*). Mesocoxae with anterior surfaces fuscous or piceous without pale areas (versus pale or with pale areas in *consanguineus*). Less constant characters are 1) the coloration of the anterior surfaces of the metafemora, completely or nearly completely dark in *macdermotti* and bicolored in *consanguineus,* and 2) the frequent presence of a median longitudinal pronotal sulcus in *macdermotti* (versus a median carinula in *consanguineus*). Specimens of *macdermotti* collected in Gainesville, Florida, are, on the average, 1.3 mm. shorter than those of *consanguineus* from Gainesville.

HOLOTYPE: Male. Form as in figure 1. Length 9.0 mm. Eyes large, separated medially above by less than diameter of eye. Pronotum with median longitudinal sulcus; with median piceous brown vitta about .27 of width of pronotum and attaining base but not apex, diffusely entering anterior coarsely punctate area; rectangular area each side of vitta rosy. Scutellum piceous black. Mesonotal areas black. Elytra piceous black; sutural bead flavate, continuously around apex, wider than explanate margin. Procoxae with anterior surfaces fuscous. Mesocoxae with anterior surfaces piceous brown. Metafemora with anterior surfaces concolorous, piceous brown. Ventral abdominal segments 2-5 piceous brown, 6 and 7 yellow and luminous, 8 translucent, 9 fuscous. Pygidium brown and truncate. Aedeagus as in *consanguineus* (see Green, 1956). Flash pattern composed of two short flashes approximately two seconds apart; repeated every four to seven seconds of flight.

TYPE LOCALITY: Gainesville, Alachua County, Florida, 12 May, 1964, J. E. Lloyd. Mesophytic woods. Attracted to a flashlight flashed in a manner to simulate the female flash-response. Deposited in the collection at Cornell University.

VARIATION: Length 8.0-10.5 mm. Width of pale elytral border varies from barely wider to much wider than explanate margin. Anterior surfaces of procoxae

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sometimes piceous brown. Anterior surfaces of metafemora occasionally bicolored. Pronotal median longitudinal sulcus occasionally absent and rarely a carinula is present.

FEMALES: Length 7.5-9.0 mm. Alate, similar to males in form and coloration. Eyes small, separated medially above by more than diameter of eye. Ventral abdominal segment 6 yellow and luminous in median third of width, pale each side; segments 2-5, 7 and 8 piceous brown. Pygidium brown and narrowly rounded. Female flash-response a single short flash emitted about one and one-half seconds after the beginning of the second pulse of the male flash pattern.

DISTRIBUTION: P. macdermotti was observed and behavior voucher specimens collected during May 1964 and April and May 1965 at Gainesville, Florida (Holotype, 61 males, 9 females), and June 1963 and 1964 at Pisgah Mountain, North Carolina (3 males, 3 females).

NOTES: This species is named in honor of Mr. Frank A. McDermott of Wilmington, Delaware.

P. consanguineus was observed and behavior voucher specimens collected during May 1964 and April and May 1965 at Gainesville, Florida (48 males, 4 females), June 1963 at Fife, Goochland County, Virginia (5 males, 4 females), and May 1965 at Otter Creek, Levy County, Florida (2 males).

The morphological characters given to distinguish *macdermotti* from *consanguineus* permit correct identification of over 95 percent of the voucher specimens of both species collected at Gainesville, Florida.

There apparently is no type of *consanguineus*. The LeConte Collection (Museum of Comparative Zoology) contains several specimens of this species, and only the first specimen bears LeConte's determination label. I have labeled this specimen "nomenifer *P. consanguineus*" in order to avoid freezing a type selection among specimens possibly not of LeConte's type series. In any case, the series in the LeConte Collection at Harvard is mixed (see Green). The nomenifer measures 12.0 mm. Pronotal carinula present. Pro- and mesocoxae pale. Metafemora bicolored, although not markedly so. Locality W. Va. (West Virginia).

Photinus tanytoxus Lloyd, NEW SPECIES

DIAGNOSIS: This species has previously been confused with *Photinus collustrans* LeConte. Male flash pattern a single flash approximately one-half second long (versus one-quarter second in *collustrans*). Flying and flashing period of males beginning after 40 minutes past sunset (versus beginning about 15 minutes past sunset and ending by 45 minutes after sunset in *collustrans*). Apical one-third to one-half of elytral sutural bead black (versus elytral sutural bead fulvous throughout in *collustrans*), (see fig. 3).

HOLOTYPE: Male. Form as in fig 2. Length 8.0 mm. Eyes large, separated medially above by less than diameter of eye. Pronotum slightly wider than long, broadly rounded in front; disk rufous, with deeply impressed longitudinal sulcus; anterior punctate area piceous black, diffusely so anteriorly. Scutellum and mesonotal areas fulvous and rufous respectively. Elytra piceous black; basal one-half of sutural bead fulvous, apical one-half black, continuously around apex; narrow explanate margin flavous, becoming fuscous apically. Each elytron tapering posteriorly with lateral and sutural margins feebly converging to near apex. Ventral abdominal seg-

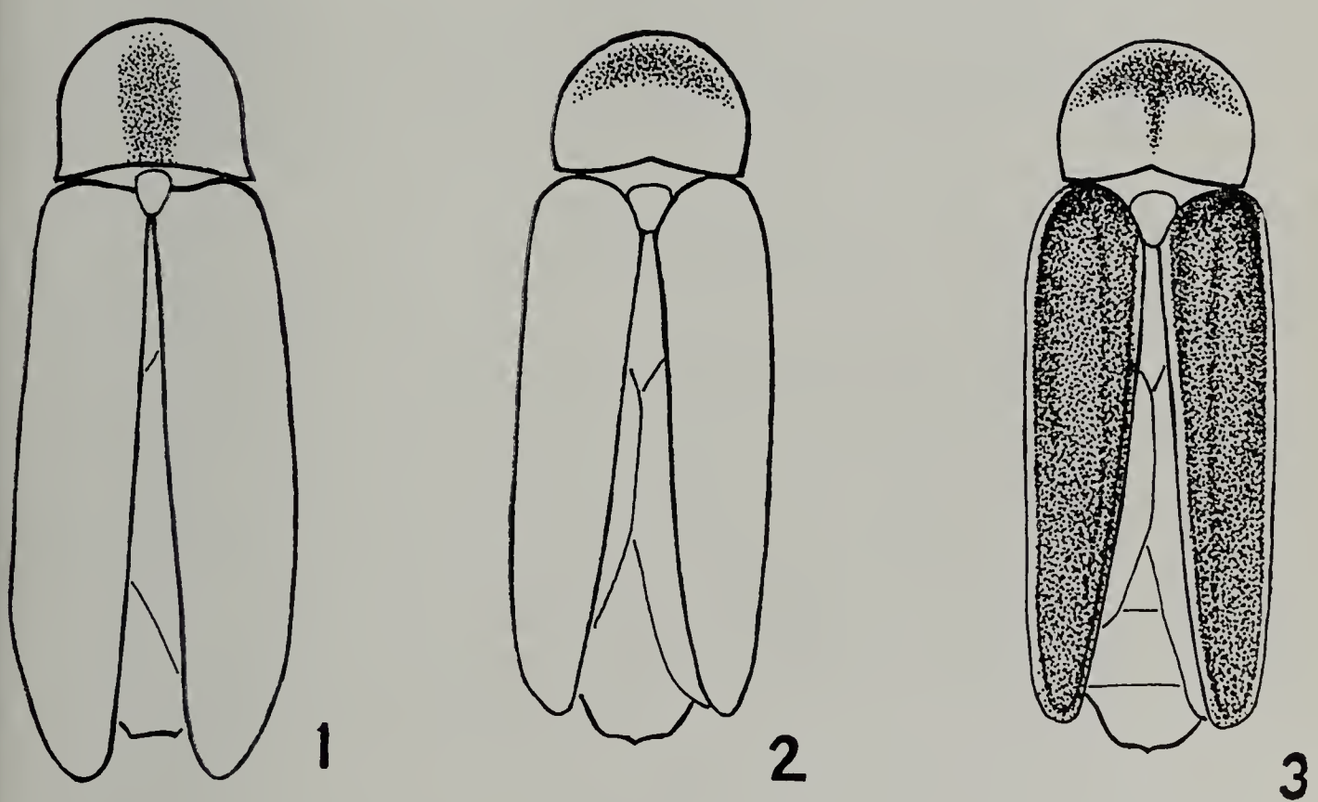
ments 2-5 piceous black, 6 and 7 yellow and luminous, 8 translucent with white spots, 9 translucent; pygidium black, apex bisinuately subtruncate. Aedeagus as in *collustrans* (see Green). Flash pattern a single long flash about one-half second in duration; emitted every two to four seconds of flight.

TYPE LOCALITY: Route 26, 3.7 miles west of Gainesville, Alachua County, Florida, 24 May, 1964, J. E. Lloyd. Pasture, probably originally a xerophytic hammock. Attracted to a female caged in a glass container. Deposited in the collection at Cornell University.

VARIATION: Length 7.0-9.5 mm. Piceous pronotal coloration frequently extends posteriorly along midline (see fig. 3). Color of elytral apical margin frequently flavous. Portion of elytral sutural bead colored black varies from one-third to one-half of length of sutural bead.

FEMALES: Length 6.0-11.0 mm. Dissimilar, elongate, brachypterous, of soft larval texture. Eyes small, separated medially above by more than diameter of eye. Pronotal and elytral coloration as in males except elytral sutural bead usually entirely black, continuously around apex, occasionally basal one-fourth fulvous. Ventral abdominal segment 6 luminous in median third of width. Other abdominal segments, both dorsal and ventral, fulvous, rosy laterally. Female flash-response a single long flash averaging one second in duration and emitted approximately one second after beginning of male flash.

DISTRIBUTION: P. tanytoxus was observed and behavior voucher specimens collected during May 1964 and April and May 1965 at Gainesville, Florida (33 males, 1 female), and 3.7 miles west of Gainesville on route 26 (Holotype, 64 males, 25 females).



FIGURES 1-3, *Photinus* spp. 1—Form of *macdermotti* n. sp. 2—Form of *tanytoxus* n. sp. 3—Composite drawing; pronotum showing dark coloration extending posteriorly along midline as found in some individuals of *tanytoxus* n. sp. and *collustrans* LeConte; left elytron with sutural bead as in *tanytoxus,* right elytron with sutural bead as in *collustrans.*

NOTES: This species is named for the appearance of the flight path of flashing males—a long arc.

P. collustrans was observed and behavior voucher specimens collected during May 1964 and April and May 1965 at Gainesville, Florida (42 males, 12 females), May 1964 and 1965 at Highlands Hammock State Park, Highlands County, Florida (21 males), May 1965 on route 26, 10 miles west of Gainesville (19 males), and 14 May, 1965 at the *collustrans* type locality, Enterprise, Volusia County, Florida (21 males).

The morphological character given to distinguish *tanytoxus* males from those of *collustrans* permits the correct identification of over 95 percent of the voucher specimens of both species.

The type of *collustrans,* in the LeConte Collection at Harvard University, has a well marked fulvous elytral bead.

Upon the completion of this study, behavior voucher specimens will be deposited in the collections at Cornell University, the California Academy of Sciences, the United States National Museum, the University of Florida, Harvard University, and the University of Michigan.

The following additions to Green's 1965 key are made; Couplet 20, page 567, first alternative, in place of "(17) *P. collustrans* LeConte" introduce the following couplet.

Elytral sutural bead black in apical one-third to one-half ---------- P. TANYTOXUS Lloyd
Elytral sutural bead fulvous throughout ---------- P. COLLUSTRANS LeConte

Couplet 25, page 568, second alternative, in place of "(25) *P. consanguineus* LeConte" introduce the following couplet.

Procoxae with anterior surfaces fuscous or piceous. Mesocoxae with anterior surfaces fuscous or piceous without pale areas ---------- P. MACDERMOTTI Lloyd
Procoxae with anterior surfaces pale. Mesocoxae with anterior surfaces pale or with pale areas ---------- P. CONSANGUINEUS LeConte

Literature Cited

Green, J. W.

1965. Revision of the nearctic species of *Photinus* (Lampyridae: Coleoptera). Proc. Calif. Acad Sci. 28(15):561-613, 19 figs.